

REMARKS

This Amendment is filed in response to the Office Action dated June 15, 2005. For the following reasons this application should be allowed and the case passed to issue. No new matter is introduced by this Amendment. The amendment to claim 1 is supported by claim 5. Support for the amendments to claims 5 and 9 is found in claim 1. New claim 18 is supported by claim 5, as originally filed.

Claims 1-18 are pending in this application. Claims 11-16 have been withdrawn pursuant to a restriction requirement. Claims 1-4, 8, and 17 have been rejected. Claims 5-7, 9, and 10 are objected to. Claims 1, 5, and 9 have been amended in this response. New claim 18 has been added.

Objection to the Drawings

The drawings are objected to as being of poor quality.

In response to this objection, formal drawings are being filed along with this response in a separate paper.

Claim Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1, 3, 4, 8, and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Watanabe (U.S. Pat. No. 6,372,389).

Claims 1 and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Chiu (U.S. Pat. No. 5,876,875).

Claims 1, 2, and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by Jurgensen et al. (U.S. Pat. No. 4,652,106).

Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Watanabe.

Claims 2-4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chiu.

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Jurgensen et al.

These rejections are traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the invention, as claimed, and the cited prior art.

An aspect of the invention, per claim 1, is a method of forming a topographical pattern in a surface of a resist layer comprising sequential steps of providing a substrate having a surface and forming a layer of a resist material of a desired thickness on the substrate surface. The resist layer has an exposed upper surface. Selected areas of the exposed upper surface of the resist layer are subjected to exposure to an energy beam to form therein a latent image of a desired topographical pattern to be formed in the resist layer. The exposed upper surface of the resist layer is contacted with a liquid developing solution comprising a preselected solvent for developing the latent image into the desired topographical pattern while ultrasonic energy is simultaneously supplied to the solution. The combination of supplying the ultrasonic energy to the liquid developing solution comprising the preselected solvent provides improved image contrast between the selected, exposed areas and unexposed areas of the resist layer and increases an interval for developing the latent image from several seconds to tens of minutes relative to when the liquid developing solution does not comprise the preselected solvent and the ultrasonic energy is not supplied thereto.

Another aspect of the present invention, per claim 5, is a method of forming a topographical pattern in a surface of a resist layer comprising developing a latent image and simultaneously supplying ultrasonic energy to the liquid developing solution, wherein the liquid developing solution comprises a solvent comprised of 50 vol. % isopropyl alcohol (IPA) and 50

vol. % de-ionized (DI) water, and the interval for developing said latent image is increased from several seconds to tens of minutes, relative to when the liquid developing solution is comprised of a solvent comprising n-amyl acetate and the ultrasonic energy is not supplied thereto.

Another aspect of the present invention, per claim 9, is a method of forming a topographical pattern in a surface of a resist layer comprising developing a latent image and simultaneously supplying ultrasonic energy to the liquid developing solution. The method comprises a method of manufacturing a master for a magnetic stamper/imprinter utilized for patterning of magnetic recording media by means of a contact printing process, wherein the latent image is of a servo pattern for a disk-shaped magnetic recording medium.

Another aspect of the invention, per claim 17, is a method of developing a latent image comprised of exposed and unexposed areas formed in a layer of a resist material comprising contacting the resist layer with a preselected liquid developing solvent while simultaneously supplying ultrasonic energy to the solvent. The combination of supplying the ultrasonic energy to the preselected liquid developing solvent provides an increased developing interval and improved image contrast between the exposed and unexposed areas of the layer of the resist material, relative to when the liquid developing solution does not comprise the preselected solvent and the ultrasonic energy is not supplied thereto.

The Examiner asserted that Watanabe discloses coating a substrate with resist, developing the resist for about 60 seconds, and rinsing the pattern formed in an ultrasonic bath. The Examiner alleged that the ultrasonic processing may be performed during the developing step.

The Examiner averred that Chiu discloses applying an ultrasonic wave to a substrate during development.

The Examiner indicated that Jurgensen et al. disclose ultrasonically agitating a light sensitive exposed layer on a length or plate of material during development.

The Examiner further asserted that the claimed substrate materials, and the negative and positive photoresist materials would have been obvious.

Watanabe, Chiu, and Jurgensen et al., whether taken alone or in combination, however, do not anticipate or suggest the claimed methods of forming a topographical pattern in a surface of resist layer. Watanabe, Chiu, and Jurgensen et al. do not suggest the claimed ultrasonic developing step of **increasing** an interval for developing the latent image from several seconds to tens of minutes, relative to when the liquid developing solution does not comprise a preselected solvent and the ultrasonic energy is not supplied thereto, as required by claim 1. Watanabe, Chiu, and Jurgensen et al. further do not suggest the ultrasonic developing step wherein the liquid developing solution comprises a solvent comprised of 50 vol. % isopropyl alcohol (IPA) and 50 vol. % de-ionized (DI) water, and the interval for developing the latent image is **increased** from several seconds to tens of minutes, relative to when the liquid developing solution is comprised of a solvent comprising n-amyl acetate and the ultrasonic energy is not supplied thereto, as required by claim 5. In addition, Watanabe, Chiu, and Jurgensen et al. further do not suggest the ultrasonic developing step as part a of method of manufacturing a master for a magnetic stamper/imprinter utilized for patterning of magnetic recording media by means of a contact printing process, wherein the latent image formed is of a servo pattern for a disk-shaped magnetic recording medium, as required by claim 9. Furthermore, neither Watanabe, Chiu, nor Jurgensen et al. disclose the combination of supplying ultrasonic energy to the preselected liquid developing solvent provides an **increased** developing interval and improved image contrast between the exposed and unexposed areas of the layer of the resist

material, relative to when the liquid developing solution does not comprise the preselected solvent and the ultrasonic energy is not supplied thereto, as required by claim 17.

Applicant further submits that none of the cited references suggest that supplying ultrasonic energy to a developing solution provides an **increased** developing interval.

Claims 1, 5, 9, and 17 are further distinguishable over Watanabe because Watanabe discloses supplying ultrasonic energy to the rinsing solution, not the developing solution as required by the claims.

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Watanabe, Chiu, and Jurgensen et al. do not disclose an ultrasonic developing step of increasing an interval for developing the latent image from several seconds to tens of minutes, relative to when the liquid developing solution does not comprise a preselected solvent and the ultrasonic energy is not supplied thereto, as required by claim 1; an ultrasonic developing step wherein the liquid developing solution comprises a solvent comprised of 50 vol. % isopropyl alcohol (IPA) and 50 vol. % de-ionized (DI) water, and the interval for developing said latent image is increased from several seconds to tens of minutes, relative to when the liquid developing solution is comprised of a solvent comprising n-amyl acetate and the ultrasonic energy is not supplied thereto, as required by claim 5; an ultrasonic developing step of

a method of manufacturing a master for a magnetic stamper/imprinter utilized for patterning of magnetic recording media by means of a contact printing process, wherein the latent image formed is of a servo pattern for a disk-shaped magnetic recording medium, as required by claim 9; and the combination of supplying ultrasonic energy to the preselected liquid developing solvent providing an increased developing interval and improved image contrast between the exposed and unexposed areas of the layer of the resist material, relative to when the liquid developing solution does not comprise the preselected solvent and the ultrasonic energy is not supplied thereto, as required by claim 17; Watanabe, Chiu, and Jurgensen et al. do not anticipate claims 1, 5, 9, and 17.

Applicant further submits that the claimed methods of forming a topographical pattern in a surface of a resist layer are not suggested by Watanabe, Chiu, and Jurgensen et al., whether taken alone, or in combination.

The dependent claims are allowable for at least the same reasons as the respective independent claims from which they depend, and further distinguish the claimed invention.

Allowable Subject Matter

Claims 5-7, 9, and 10 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.

Applicant gratefully acknowledges the indication of allowable subject matter. In accordance with the Examiner's recommendation, claim 9 has been rewritten in independent form including all of the limitations of original claim 1. Claim 5 has also been rewritten in independent form including all the limitations of original claim 1, however several limitations from originally filed claim 5, which are not believed to be necessary for the patentability of claim 5, have been removed from claim 5 and placed in new, dependent claim 18.


Application No.: 10/602,881

In light of the above Amendment and Remarks, this application should be allowed and the case passed to issue. If there are any questions regarding these remarks or the application in general, a telephone call to the undersigned would be appreciated to expedite prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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